

CLAIMS:

1. A displacement varying structure of a variable  
displacement compressor that is installed in a refrigerant  
5 circuit, wherein the refrigerant circuit has a discharge  
pressure zone and a suction pressure zone, wherein the  
variable displacement compressor has a crank chamber, and  
wherein the displacement varying structure is capable of  
varying a displacement of the variable displacement compressor  
10 by changing a pressure of the crank chamber, the displacement  
varying structure comprising:

a supply passage for connecting the crank chamber with  
the discharge pressure zone;

a bleed passage for connecting the crank chamber with the  
15 suction pressure zone; and

a control valve located in a control passage, the control  
passage being one of the supply passage and the bleed passage,  
wherein the control valve includes:

a valve housing defining a valve chamber, a valve hole,  
20 and a pressure sensing chamber, wherein the valve chamber and  
the valve hole form a part of the control passage;

a valve body accommodated in the valve chamber, wherein  
the valve body is capable of being displaced, and wherein the  
valve body adjusts an opening degree of the valve hole in  
25 accordance with the position of the valve body in the valve  
chamber;

a pressure sensing member accommodated in the pressure  
sensing chamber, wherein the pressure sensing member divides  
the pressure sensing chamber into a first chamber and a second  
30 chamber, and wherein the pressure sensing member is capable of  
being displaced in accordance with a pressure difference  
between the first chamber and the second chamber;

a separation wall that separates in the valve housing the  
valve chamber and the pressure sensing chamber from each  
35 other, wherein the separation wall has a through hole for

connecting the valve chamber and the second chamber with each other;

a rod that extends through the through hole and connects the pressure sensing member and the valve body with each other, wherein the rod has a separation portion that blocks connection between the valve chamber and the second chamber through the through hole; and

an adjacent zone that is adjacent to the second chamber with the separation portion in between, wherein, if a part of the through hole that is closer to the valve chamber than the separation portion and opens to the valve chamber forms the valve hole, the valve hole is the adjacent zone, and if the valve hole is located at the opposite side of the valve chamber with respect to the second chamber, the valve chamber is the adjacent zone, and wherein the adjacent zone and the second chamber are connected to a common pressure zone in the refrigerant circuit.

2. The displacement varying structure according to claim 1, wherein the control passage is the supply passage, and the discharge pressure zone includes a first pressure zone and a second pressure zone, wherein the pressure of the first pressure zone is higher than the pressure of the second pressure zone, and wherein the first chamber is connected to one of the first and second pressure zones, and the second chamber and the adjacent zone are connected to the other one of the first and second pressure zones.

3. The displacement varying structure according to claim 2, wherein a restrictor is provided in the discharge pressure zone, and wherein a section of the discharge pressure zone that is upstream of the restrictor comprises the first pressure zone, and a section of the discharge pressure zone that is downstream of the restrictor comprises the second pressure zone.

4. The displacement varying structure according to claim 1, wherein the control passage is the bleed passage, and the suction pressure zone includes a first pressure zone and a  
5 second pressure zone, wherein the pressure of the first pressure zone is higher than the pressure of the second pressure zone, and wherein the first chamber is connected to one of the first and second pressure zones, and the second chamber and the adjacent zone are connected to the other one  
10 of the first and second pressure zones.

5. The displacement varying structure according to claim 4, wherein a restrictor is provided in the suction pressure zone, and wherein a section of the suction pressure zone that  
15 is upstream of the restrictor comprises the first pressure zone, and a section of the suction pressure zone that is downstream of the restrictor comprises the second pressure zone.

20 6. The displacement varying structure according to claim 1, wherein the compressor has a compressor housing in which an accommodation recess is formed, wherein the control valve is inserted in the accommodation recess, and wherein the second chamber and the adjacent zone are connected to each other  
25 through a space defined between an inner surface of the accommodation recess and an outer surface of the valve housing.

7. The displacement varying structure according to claim 30 1, wherein a connecting passage for connecting the second chamber to the adjacent zone is formed in the valve housing.

8. The displacement varying structure according to claim 35 1, wherein the control valve has an actuator, and wherein, based on an external command, the actuator changes a force

applied to the valve body.

9. A refrigerant circuit containing a variable displacement compressor, wherein the variable displacement  
5 compressor has a crank chamber, and a displacement of the variable displacement compressor is varied by changing a pressure of the crank chamber, the refrigerant circuit comprising:

a discharge pressure zone;

10 a suction pressure zone;

a supply passage for connecting the crank chamber with the discharge pressure zone;

a bleed passage for connecting the crank chamber with the suction pressure zone; and

15 a control valve located in a control passage, the control passage being one of the supply passage and the bleed passage, wherein the control valve includes:

a valve housing defining a valve chamber, a valve hole, and a pressure sensing chamber, wherein the valve chamber and  
20 the valve hole form a part of the control passage;

a valve body accommodated in the valve chamber, wherein the valve body is capable of being displaced, and wherein the valve body adjusts an opening degree of the valve hole in  
25 accordance with the position of the valve body in the valve chamber;

a pressure sensing member accommodated in the pressure sensing chamber, wherein the pressure sensing member divides the pressure sensing chamber into a first chamber and a second chamber, and wherein the pressure sensing member is capable of  
30 being displaced in accordance with a pressure difference between the first chamber and the second chamber;

a separation wall that separates in the valve housing the valve chamber and the pressure sensing chamber from each other, wherein the separation wall has a through hole for  
35 connecting the valve chamber and the second chamber with each

other; and

a rod that extends through the through hole and connects the pressure sensing member and the valve body with each other, wherein the rod has a separation portion that blocks

5 connection between the valve chamber and the second chamber through the through hole,

wherein a part of the through hole that is closer to the valve chamber than the separation portion and opens to the valve chamber forms the valve hole, and wherein the valve hole  
10 and the second chamber are connected to a common pressure zone in the refrigerant circuit.

10. The refrigerant circuit according to claim 9, wherein the control passage is the supply passage, and the discharge  
15 pressure zone includes a first pressure zone and a second pressure zone, wherein the pressure of the first pressure zone is higher than the pressure of the second pressure zone, and wherein the first chamber is connected to one of the first and second pressure zones, and the second chamber and the valve  
20 hole are connected to the other one of the first and second pressure zones.

11. The refrigerant circuit according to claim 10, wherein a restrictor is provided in the discharge pressure  
25 zone, and wherein a section of the discharge pressure zone that is upstream of the restrictor comprises the first pressure zone, and a section of the discharge pressure zone that is downstream of the restrictor comprises the second pressure zone.

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12. The refrigerant circuit according to claim 9, wherein the control passage is the bleed passage, and the suction  
pressure zone includes a first pressure zone and a second  
pressure zone, wherein the pressure of the first pressure zone  
35 is higher than the pressure of the second pressure zone, and

wherein the first chamber is connected to one of the first and second pressure zones, and the second chamber and the valve hole are connected to the other one of the first and second pressure zones.

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13. The refrigerant circuit according to claim 12, wherein a restrictor is provided in the suction pressure zone, and wherein a section of the suction pressure zone that is upstream of the restrictor comprises the first pressure zone, and a section of the suction pressure zone that is downstream of the restrictor comprises the second pressure zone.

14. The refrigerant circuit according to claim 9, wherein the compressor has a compressor housing in which an accommodation recess is formed, wherein the control valve is inserted in the accommodation recess, and wherein the second chamber and the valve hole are connected to each other through a space defined between an inner surface of the accommodation recess and an outer surface of the valve housing.

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15. The refrigerant circuit according to claim 9, wherein a connecting passage for connecting the second chamber to the valve hole is formed in the valve housing.

25 16. The refrigerant circuit according to claim 9, wherein the control valve has an actuator, and wherein, based on an external command, the actuator changes a force applied to the valve body.